Moreover based on my review of the data, the rates of enteric infectious diseases in the region of the IRW are consistent with national disease levels.

9. Use of Indicator Organisms in Recreational Water to Predict Human Health Risks

a. While it is true that most disease-producing microbes of fecal origin are more likely to be found in water containing fecal markers, the converse is not correct, that fecal markers indicate the presence of disease-causing microbes. Also, not finding fecal markers does not mean there are no disease-causing microbes in water. As an example, one of the largest oyster-associated outbreaks of hepatitis A (a virus from human fecal contamination) occurred when oysters were harvested in an area negative for fecal markers including E. coli. Several studies have suggested certain threshold levels of fecal organisms when found in water predict increased risk of human gastroenteritis. Enterococcus, coliforms and fecal coliforms are considered harmless themselves and may contain non-fecal organisms such as Klebsiella. E. coli is the single species indicative of introduction of feces of animal

and human origin and is becoming the indicator of choice for documentation of fecal contamination of food and water samples. Their presence does not confirm the presence of a disease-causing microbe.

b. It is not feasible to establish a zero standard for ground water and recreational water in terms of presence of indicator organisms. Proximity of wild animals (including lower mammals) and human populations will assure low level contamination. Finding E. coli and other fecal markers in water as it is currently studied for quality by health departments and the EPA does not allow the determination of the origin of the bacteria, from a specific animal, group of animals or from humans. This is important as fecal markers from human populations will show a more direct correlation with human illness as opposed to fecal markers of animal origin. Molecular fingerprinting methods are under development presently in our laboratory and in other research laboratories but these procedures are not yet accepted in the medical and scientific community. Currently this method is considered research.

c. After seeing comments by Plaintiffs' experts I feel it necessary to indicate that it is inappropriate to equate presence of E. coli in water with presence of a diarrhea-producing E. coli. E. coli is a normal inhabitant of our lower gastrointestinal tract and is not considered a cause of human disease through exposure or ingestion. It is this "normal" E. coli that is being detected as a fecal marker in water quality studies. The E. coli that cause human diseases are distinct organisms each showing a different reservoir, routes of transmission and resultant disease and are not of poultry origin. When considering the diarrhea-producing E. coli, rather than indicator E. coli, it is necessary to specify the type of E. coli pathogen being considered so as to not confuse persons less informed about intestinal infections and the causes of human illness.

10. Importance of Species Specificity for Enteric (Intestinal) Disease Producing Microbes

Most microbes destined for human infections show an important degree of species specificity. That is, there exists an important barrier for transmission of most animal organisms to humans through common exposure. The

following organisms cause illness in humans but the source is from other humans and not animals: enterotoxigenic E. coli, Shigella, and noroviruses. Giardia, a waterborne parasite lives in the intestinal tract of many animals with some being able to cause disease in humans and many not being able to do so. For example household pets may be infected by Giardia but they rarely transmit the organism. Beavers and muskrats may harbor a Giardia type that can cause human illness. Birds are not important sources of Giardia for humans or mammals. In fact Giardia in birds (including poultry) is given the name of Giardia psittaci to indicate their differences from human strains known as Giardia duodenalis. Similarly the parasite Cryptosporidium shows species specificity and while strains from cattle can infect persons, it appears that Cryptosporidium from poultry is not a threat to humans and in experimental studies was not found to readily infect mammals. The importance of species specificity will later be discussed under the importance of people for transmission of intestinal infections to other humans.

11. Specific Issues Dealing with Shiga Toxin-Producing E. coli, Salmonella and Campylobacter

a. The available evidence does not support the conclusion that E. coli O157:H7 infection is spread to humans from poultry

populations. These infections are importantly spread from ruminants to human populations recently through produce contaminated by excreta in growing fields adjacent to cattle farm operations.

b. Poultry is a reservoir for Salmonella and Campylobacter relevant to human medicine and disease. As mentioned earlier, both are moderate-inoculum organisms generally requiring a food vehicle to allow them to grow to sufficient levels to produce human illness.

c. The rates of human Campylobacter, Salmonella and E. coli O157 illness in Oklahoma as a whole as well as the four Oklahoma counties in the IRW resemble rates seen nationally in the U.S. I saw no evidence that the state has a unique or serious health threat from these pathogens of potential animal origin.

12. Relationship Between Ground and Recreational Water and Non-Enteric (Intestinal) Infectious Diseases

There has been some concern by plaintiff's experts that exposure to water containing fecal markers could result in non-intestinal infection including urinary tract infection and external ear infection (otitis externa). Urinary

tract infections occur in children with anatomic abnormalities of the genitourinary tract or in older women who acquire the organism from their own body. In the next section I will deal with human infections from body bacteria. I am aware of no evidence to suggest that urinary tract infections are acquired from contaminated water. Regarding external ear infections, the way that swimming contributes to this is by providing moisture in the ear canal which favors the growth of microbes. The major bacterial causes of otitis externa are Staphylococcus (from the skin of a person), pseudomonas (associated with any moisture including that from a shower) and occasionally a fungus, again associated with chronic ear moisture, not contaminated recreational water per se.

13. Humans as a Reservoir of Infectious Diseases

While animals are the source of many human infections, collectively called zoonoses, a single animal species (e.g. poultry) contributes very few infectious agents for humans. For poultry the human health problems relate to Salmonella and Campylobacter discussed above. In addition to species specificity being important in infection, the reservoir of organisms is also important. The human host resembles the Peanuts character, "Pigpen". We are each surrounded by and colonized by 100 trillion bacteria, ten times the number of cells of the body. The body's bacteria commonly cause what we

call an endogenous (from inside the body) infection. Examples of endogenous (from outside the body) infection from our own bacteria are urinary tract infections and hospital-acquired infections after surgery. The other type of human infection is an exogenous infection where the infecting organisms come from outside the body from another source. This is the type of infection we see for Salmonella and Campylobacter. When people are infected by an exogenous organism the infected persons may excrete the organisms just before they become ill and they continue to shed the organism after they recover. At these times, they serve as a reservoir of the organisms and can infect others. Humans are infected with microbes that are adapted for human infection and illness while microbe strains from animals are often incapable of causing illness in people.

In my opinion, the many persons living in the IRW are at the greatest risk for intestinal infections from human excreta. Because of species specificity one cannot overlook the importance of septic system contamination of the IRW. Presence of human excreta in the ground- and recreational-water is likely to select for disease-causing microbes of greatest danger to persons living in the region.

14. Human Consequences of Repeated Exposure to the Same Disease-Causing Microbe that Could be Found in Water

When persons become exposed to an organism in contaminated water or contaminated food a disease may result if the organism is in sufficient numbers to reach the illness threshold. Following repeated exposure to a specific strain of bacteria, parasite or virus that may be encountered in water, the exposed persons characteristically develop immunity to the organism and related organisms. This is seen in that persons living in mountainous areas of the U.S. (say in Colorado) who are quite resistant to Giardia as they have been exposed before to the parasite in local water sources. On the other hand, visitors to the region are susceptible to the parasite and may become ill after exposure to contaminated persons, water or food. Also, children newly entering day care centers (DCC) or international travelers to developing regions are usually susceptible to the prevalent organisms at first, but within one month of arrival in the DCC or developing region they have acquired immunity to the prevalent organism. This natural immunization is the basis of our vaccine approaches to prevent infectious diseases. If a person has an organism in their well water, we would expect them to develop immunity to the agent and not to be recurrently ill.

15. In Summary,

In my opinion there is no imminent and substantial risk for intestinal infectious diseases among the people living in the IRW and being exposed to local ground water or participating in recreational use of the water.

I am happy to comment further on these points as additional information becomes available.

FURTHER AFFIANT SAYETH NOT.

STATE OF TEXAS §
§
COUNTY OF HARRIS §

SUBSCRIBED AND SWORN before me this 6th day of February, 2008.

Notary Public
My Commission Expires: 3-4-2011

SHERI LYNN ALLRED
MY COMMISSION EXPIRES
March 4, 2011

January 2008

CURRICULUM VITAE

Herbert L. DuPont, M. D.

Date of Birth:	November 12, 1938
Place of Birth:	Toledo, Ohio
Religion:	Protestant
Social Status:	Married, two children
Degrees:	A.B., Ohio Wesleyan University, 1961 M.D., Emory University School of Medicine, 1965
Postgraduate Education:	Medical Internship - University of Minnesota Hospitals, 1965-1966 Medical Residency - University of Minnesota Hospitals, 1966-1967 Fellowship, Infectious Diseases - University of Maryland School of Medicine, 1967-1969
Licensed:	Georgia and Texas
Board Qualifications:	American Board of Internal Medicine Qualifying Examination, October 1970 Diplomat in Internal Medicine Oral Examination, February 1972
Hospital Admitting Privileges:	Internal Medicine and Infectious Diseases, St. Luke's Episcopal Hospital, Hermann Hospital, and Harris County Hospital District (Houston)
Service with United States Public Health Service:	Epidemic Intelligence Service Officer (Centers for Disease Control) assigned to the University of Maryland where studies of induced enteric infectious diseases in volunteers were conducted for the purpose of bacterial vaccine development, 1967-1969
Past Medical School Faculty Appointments:	Instructor in Medicine, Division of Infectious Diseases, University of Maryland School of Medicine, July 1969 Assistant Professor of Medicine, Division of Infectious Diseases, University of Maryland School of Medicine, July 1970 Associate Professor of Medicine, Division of Infectious Diseases, University of Maryland School of Medicine, July 1972 Professor of Medicine, Founding Director, Program in Infectious Diseases and Clinical Microbiology, The University of Texas Medical School at Houston, 1973-1988